**Changes in Use of Health Services
During Indonesia's Economic Crisis**

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ABSTRACT

This paper uses panel data from the 1997 and 1998 rounds of the Indonesian Family Life Survey to examine changes in the health sector in Indonesia during the first year of the economic crisis. Changes in the characteristics of health facilities themselves were substantial. Prices rose at public and private sector sources of care, while public facilities experienced drug stock outages with increasing frequency. Community health posts also experienced changes for the worse, particularly with respect to the availability of supplies and supplementary food. These changes are related to use of care by adults and children, which generally declined between 1997 and 1998. Declines in use are also related to characteristics of the individuals themselves, such as age, and to socioeconomic characteristics of the households.

INTRODUCTION

   After several decades of strong economic growth, 1998 was a year of economic reversal in much of Asia. The economic downturn that began in Thailand in mid-1997 soon spread to other Southeast Asian countries. Indonesia, Malaysia, and the Philippines were all affected, experiencing sharp currency depreciation, declines in stock market values and in the rate of economic growth, and increases in prices. Similar crises occurred in the 1990s in Mexico, Brazil, Russia, and Ecuador. One factor implicated in these crises is the speed with which capital can now be invested and withdrawn from a country—suggesting that sharp economic downturns will be part of the economic landscape for the foreseeable future (Griffin-Jones, Cailloux, and Pffafenzeller, 1998).

   The economic changes in Indonesia were large and unexpected. In 1997 economic growth reached almost 5%. By 1998 per capita GDP declined by 15% (Arndt and Hill, 1999, p. 6). Over the course of twelve months prices for food and for other goods and services rose steeply, while wages nowhere near kept pace. In the decades prior to 1998 Indonesia had experienced improvements in a number of key indicators of socioeconomic development, fueled in part by strong economic growth.

   The economic crisis prompted concern that Indonesia's progress in improving human resources would cease. With respect to the health sector, service quality was expected to deteriorate sharply in the face of rising costs of imported goods. Moreover, many policy makers predicted sharp decreases in use of private services as the middle class shifted into use of highly subsidized public sector services, potentially crowding out use by the poorest Indonesians.

   In this paper we explore the impact on the health sector of Indonesia's economic crisis. We use data from the 1997 and 1998 rounds of a panel survey of individuals, households, and communities in Indonesia, the Indonesia Family Life Survey (IFLS), to address several

questions. First, we examine whether in 1998 individuals maintained the levels of investments in

use of health care they were making in 1997.   Second, we characterize changes in the health

sector. Finally, we link levels and changes in use of health care, at the individual level, to

individual and household characteristics and to characteristics of the health service environment.

These analyses allow us to determine which population sub-groups were relatively more affected

by the economic crisis in terms of use of health care, and how individuals responded to changes

in the health service environment. Our results shed light on changes in the health sector and

health service use during economic downturn.

BACKGROUND

   Relatively little is known about how economic crises of the sort that have occurred in recent

years affect individuals' choices about investments in human resources—in part because

comparable (preferably longitudinal) data with adequate sample sizes from before and during or

after the crisis are rarely available.

   Several studies have focused on the impact of economic crises not on individuals, but on

health services. A study in the Dominican Republic, for example, documents breakdowns in the

distribution of drugs and supplies at hospitals over the period when inflation was high

(Whiteford, 1993).   In Malaysia, the Ministry of Health faced a budget cut of 12 percent during

the economic crisis of the late 1990s, requiring it to prioritize its projects to meet needs for

vulnerable populations and to develop guidelines so that health care practitioners could reduce

the expenditures on drugs (Suleiman et al., 1998).   Budget cuts to Ministries of Health and

Family Planning also occurred in Thailand and the Philippines (UNFPA, 1998).

   In Indonesia data from a longitudinal monitoring system in Central Java has documented

some of the changes in the health sector that have occurred since the onset of the crisis. Both

public and private health providers raised their fees for services, including for prenatal care and family planning. At the same time, the prices of drugs increased, while the availability of drugs decreased (UNFPA, 1998). The Central Java data also document that, among female visitors to public health centers, the fraction who present with morbidities has risen while the fraction presenting in good health has fallen, suggesting that women are cutting back on preventive visits and going only when they are sick.

Beyond studies specifically on the health sector during economic downturn, other analyses have addressed the more general question of how quality and prices of services affect use of services. In a number of analyses spatial variation in prices has been exploited to assess the price elasticity of demand for various types of health services (Schwartz, Akin, and Popkin, 1988; Gertler, Locay, and Sanderson, 1987; Gertler and van der Gaag, 1989). Other analyses have incorporated measures of quality of care into research on the determinants of utilization (Schwartz, Akin, and Popkin, 1988; Litvack and Bodart, 1993; Lavy and Germain, 1993; Mwabu, Ainsworth, and Nyamete, 1993; Akin, Guilkey, and Denton, 1995, Haddad and Fournier, 1995).

The data we use allow us to circumvent two methodological issues that plague many analyses of health care use. First, our community-level data on health services are unusually rich, so we have considerable scope in the construction of variables that measure service price and quality. Second, because we have data on the same individuals at two points in time, between which occurred large and unexpected changes in the health service environment, our results are less subject to the criticism that the distribution of health service quality reflects unmeasured aspects of the tastes of the population with respect to use of health care, or efforts on the part of the government to provide services where they are most needed.

Before turning to our data and descriptive statistics, we set the stage for our analyses by briefly describing the three types of health services considered in this paper.

At the community level the backbone of Indonesia's health infrastructure system is the public health center (*puskesmas*). The health center provides a range of services and is a basic source of subsidized outpatient care for men, women, and children. Health centers are generally headed by a doctor, who oversees a midwife and various paramedical workers (MOH 1990). Each subdistrict (consisting of 20-40 villages or townships) has one or more health centers and often several auxiliary health centers.

Private practitioners are also an important source of health care in Indonesia. Generally private services are more available in urban than in rural areas, but because employees of the health center can offer private services when the health center is closed, private practitioners are found throughout rural areas as well (Gani, 1996; Brotowasisto et al., 1988; World Bank, 1990).

To meet the special needs of women of reproductive age and children less than five, most communities in Indonesia have established health posts (*posyandu*). The health post is a monthly activity staffed by community volunteers and if possible by staff from the health centers. When health workers are present the posts generally provide prenatal care, immunization, and contraceptive injections (Kosen and Gunawan, 1996). Otherwise services include the provision of vitamins, oral rehydration solution, nutritional screening and oral contraceptives.

DATA AND DESCRIPTIVE STATISTICS

In this paper we compare data from individuals and households interviewed in late 1997 as part of the second Indonesia Family Life Survey (IFLS2), with data from those *same*

individuals and households interviewed one year later in 1998 (IFLS2+). This longitudinal

design is scientifically advantageous because to the extent that attrition is low, sample

composition remains constant across waves and differences in respondents over time will reflect

real changes, rather than differences in who was interviewed.

The two waves analyzed in this paper, IFLS2 and IFLS2+, are part of an on-going

longitudinal survey. The IFLS sample is representative of about 83% of the Indonesian

population and contains information on over 30,000 individuals. The first wave, IFLS1,

interviewed a total of 7,224 households (Frankenberg and Karoly, 1995). The second wave

(IFLS2) was fielded between August 1997 and January 1998, with the goal of recontacting all

original IFLS households and reinterviewing all IFLS1 main respondents. We succeeded at

reinterviewing 94% of the IFLS1 households and 91% of target respondents (Frankenberg and

Thomas, 2000).

The IFLS2 was uniquely well-positioned to serve as a baseline for a follow-up during the

economic crisis that unfolded in Indonesia in 1998. Accordingly, a 25% subsample of the IFLS

households was reinterviewed one year later. IFLS2+ households were interviewed in 7 of the

13 IFLS provinces (West Nusa Tengarra, Central Java, Jakarta, West Java, South Kalimantan,

South Sumatra, and North Sumatra), which together span the full spectrum of socio-economic

status and economic activity in the larger IFLS sample (Thomas, Frankenberg, and Smith, 2001).

Within those provinces, 80 enumeration areas were purposively drawn with weighted

probabilities in order to match the IFLS sample as closely as possible. The IFLS2+ sample

provides a good representation of the entire IFLS sample in terms of observable socio-economic

and demographic characteristics, such as household size and age and education of the household.

The households of central interest for this study are those interviewed in both 1997 and 1998, since only for these households can we contrast patterns of health care use just before the crisis with those patterns during the crisis. Of the 1,934 households selected for IFLS2+, we interviewed over 98%. At the individual level our completion rate was 95% of the IFLS2 respondents, with a total of 8,212 individuals interviewed in both surveys. Because our reinterview rates are so high, attrition bias in our study is not an issue (Thomas, Frankenberg, and Smith, 2001).

A key feature for this paper is that the survey timing is appropriate for pinpointing the short-term impacts of the crisis (Figure 1). IFLS2 was fielded in the second half of 1997, just before the *rupiah* depreciated precipitously in comparison to the U.S dollar. By design, IFLS2+ was fielded one year later, during the second half of 1998.

Another important characteristic of the IFLS data is that is extremely rich in content. In this paper we analyze the information on use of health care for individuals. For adults and children, we identify all outpatient visits that took place in the month before the survey. For children under five additional questions also cover visits to the health post in the month before the survey and receipt of Vitamin A supplements in the six months prior to the survey.

Figure 2 depicts percentage changes in use of care between 1997 and 1998 for three age groups: children 0 to 4 years of age, children 5-14 years of age, and adults 15 and older. The first three bars display changes in use of private services. Although rates of use of private services fell between 1997 and 1998 for all three groups, the changes are not statistically significant. The second three bars display changes in use of public services. For this sector, for all three age groups, the declines in use are statistically significant, ranging from a decrease of 23% for adults to a 32% decrease for children 0 to 4 years of age.

The final two bars refer to use of preventive services among children less than five. The

most comprehensive of preventive efforts for children under five is the health post program,

described in the introduction. Between 1997 and 1998 visits to health posts fell by 52%.

Although some of this decline results from children becoming older (five-year-olds in 1997 will

be six by 1998 and no longer targets of the program), the decreases are also large for children

less than four (45%) and for children less than three years (38%) (results not depicted). Possibly

children who reduced visits to health posts in 1998 still received services from other providers or

via other outreach efforts. The final bar of the figure suggests otherwise. The fraction of

children under five who received a Vitamin A tablet in the six months prior to the survey fell by

19% between 1997 and 1998

The IFLS data are not limited to households and individuals. Through interviews with

community leaders and by visits to markets, health care providers, and schools, we obtain

information on a number of dimensions of community characteristics. In each community data

are collected about facilities through visits to as many as 12 health care providers and 8 schools.

With respect to health services, the facilities include public providers (health centers), private

providers (private clinics and the practices of doctors, midwives, nurses, and paramedics) and

community health posts. The facility questionnaires address the availability, price, and quality of

services at each interviewed facility.

The sample of facilities interviewed in 1997 was drawn on the basis of responses in the

household survey to questions about knowledge of health facilities (Frankenberg and Thomas,

2000). In each community the most frequently mentioned facility was interviewed and

additional facilities were selected at random. In 1998 community interviewers were instructed to

reinterview the 1997 facilities. If a facility interviewed in 1997 could not be recontacted in 1998,

interviewers added a facility of the same type based on a recommendation from the head of the

community. In 1997 a total of 260 public health centers, 526 private practitioners, and 178

health posts were interviewed. Of these, 217 health centers, 392 private practitioners, and 150

health posts were reinterviewed in 1998. An additional 20 health centers, 87 private

practitioners, and 9 health posts were interviewed for the first time in 1998.

FACILITY CHARACTERISTICS IN 1997 AND 1998

In this section, we explore evidence regarding the extent of change in facility

characteristics between 1997 and 1998. Table 1 presents data on selected facility characteristics

in 1997 and 1998 and on *changes* in those characteristics by 1998 (measured in percentage

points in the first and third panels and in *rupiah* in the second panel). The IFLS data contain a

rich array of measures of facility characteristics from which to choose. We examine a few

indicators of service availability but focus primarily on characteristics that are particularly likely

to have changed within a one-year time span, such as prices and the availability of non-durable

supplies and medicines.

The first panel of the table examines the availability of basic services at public and

private providers. At health centers, two services declined in availability between 1997 and

1998: laboratory tests for hemoglobin level and Vitamin A. Vitamin A also declined in

availability at private providers. The proportion of private providers offering medicine as part of

their curative care package actually rose significantly between 1997 and 1998, from 83% to 88%

of all providers interviewed.

The second panel of the table provides information on the price (in *rupiah*) of various

services and drugs in 1997 and 1998. Drug prices are reported for the standardized quantity

indicated in the table. At both public and private providers the price of most services rose

dramatically between 1997 and 1998. For example the cost to have a wound stitched rose by over 400 Rp at public facilities, and by over 2700 Rp at private facilities. In both years prices at public facilities are low relative to prices at private providers. At private practices the prices charged for various medicines also increased significantly. Drug prices did not rise significantly at public facilities, where the cost for medicines is often included in the price of treatment (the low prices reported for medicines at public facilities reflects the fact that the marginal cost to the client is often zero once they have paid for a particular service).

The third panel of the table examines the frequency of stock outages of various drugs. For this dimension of service quality, the sharpest change is observed at public facilities: the frequency of stock outages rose significantly for a number of medications. For example, the percentage of health centers experiencing an outage of ampicillin rose from 23% in 1997 to 42% in 1998, an increase of 19 percentage points. In contrast, for only one medication (tetracycline, an antibiotic) did stock outages become significantly more common at private facilities.

The services provided at public and private facilities are comparable on many dimensions and we view these types as substitutes for one another. Health posts, on the other hand, concentrate on preventive services for children, including growth monitoring, nutrition education, and provision of micronutrients and oral rehydration solutions. The results in Table 2 show that the ability of health posts to provide these services declined between 1997 and 1998. The fraction of health posts offering supplementary feeding decreased by 12 percentage points, from 84% to 72%. Declines of similar magnitude occurred with respect to the fraction of health posts with health cards and oral rehydration solution, while the proportion of health posts with Vitamin A fell by 33 percentage points, from 82% to 49%.

The results discussed above provide evidence of changes in the average characteristics of facilities interviewed in 1998 and facilities interviewed in 1997. We also examined differences in means over time for the subset of facilities interviewed in both 1997 and 1998 (the "panel" facilities), and whether the changes that individual panel facilities experienced between 1997 and 1998 differed significantly from zero. These additional analyses (results not shown) confirm the results of Tables 1 and 2. In combination the results provide strong evidence of significant changes in facility characteristics during the year of the crisis. Prices increased at private facilities, stock outages of medicines increased at public facilities, and health posts experienced declines in the availability of supplies and the capacity to offer supplementary food.

In relating facility characteristics to use of services, two methodological issues are of particular concern. First, at a given facility, a price rise in one service or a stock outage of one drug is likely to be correlated with similar changes in other services or drugs. In a regression context, including quality measures that are highly correlated with one another will dilute our estimates of the relationship between facility characteristics and use of services. On the other hand, including one arbitrarily selected indicator will not necessarily accurately capture the relationship between facility characteristics and use.

As an alternative, we constructed three index variables. One index summarizes service prices and is based on the average of the prices the facility charges for commonly provided services: visits for curative care, prenatal care, and for tuberculosis, dressing a wound, immunizations against Hepatitis B and BCG, and the cost of contraceptives (one cycle of oral contraception, one injection). A second index summarizes stock outages at public facilities and is based on the fraction of medicines (among those provided) for which the facility experienced a stock outage in the past six months. The 15 medicines used in this index include antibiotics,

anti-inflammatories, an anti-tuberculin, micronutrients, oral and injectable contraceptives, and
cough syrup and skin ointment. A third index summarizes supply availability at health posts,
and consists of the number of the following supplies the health post has: health cards, Vitamin
A, iron pills, and oral rehydration solution.

A second methodological issue in relating facility characteristics to use of health care is
that, within a community, individuals typically have access to more than one facility. Use of
care should be more sensitive to changes in the aggregate characteristics of the facilities in the
area than to changes in the characteristics of one individual facility. For this reason we create a
community-level average of each of the three index variables. Additionally, for each community
we calculate, the fraction of health posts that offered supplementary food in 1997 and in 1998.

The means of these variables for the 80 IFLS communities are presented in Table 3. The
index of service costs at both public and private facilities rose significantly between 1997 and
1998. At public (but not private) facilities the index of drug stock outages rose significantly as
well. The availability of supplies fell at health posts, as did the fraction of health posts offering
supplementary feeding. Thus, at the level of the community as well at the level of the facility,
prices of private and public sector care increased, while the quality of services at pubic facilities
and at health posts declined.

**HEALTH CARE USE AND INDIVIDUAL HOUSEHOLD, AND FACILITY
CHARACTERISTICS**

Figure 2 shows clear declines between 1997 and 1998 in use of public health care and,
for children less than five, in use of preventive care. We now turn to the question of how the
characteristics of individuals, their households, and the facilities in their communities are related
to use of care.

To examine patterns in service use we divide our respondents into two groups: those age five years and older and those less than five. For both age groups we consider use of public and private outpatient care. For children less than five we go on to consider visits to health posts and receipt of Vitamin A.

We first consider use of care from a cross-sectional perspective. In a given year, individuals choose whether to use private care, public care, or no care. We model this choice, for both 1997 and 1998, with a multinomial logistic regression in which the reference category is use of no care (the small number of respondents who report use of both types of services were excluded). For children less than five, two additional decisions are considered: whether to visit a health post and whether to take Vitamin A. We model these two choices as dichotomies, using a logit specification.

We also analyze changes in patterns of care use over time. For these models we estimate a multinomial logistic regression in which the reference outcome (no change in use between 1997 and 1998) is compared to four possible alternatives: transitioning into use of public care, transitioning into use of private care, transitioning out of use of public care, and transitioning out of use of private care. In these regressions the dependent variable reflects behavior in both 1997 and 1998. The coefficients must be interpreted accordingly. For example, a negative coefficient for the odds of transitioning out of use of public care could arise either because respondents with that characteristic are particularly unlikely to use public care in 1998, or because they were particularly unlikely to use public care in 1997 and therefore few of them are at risk for transitioning out of use of care by 1998. For respondents less than five, we do not estimate a transitions model for use of public and private care, since our sample size for this group is small

and rates of use are relatively low. We do, however, examine transitions in visiting a health post and in receiving Vitamin A, where use rates are higher.

With respect to facility characteristics, we include in the models the measures of characteristics presented in Table 3. The indexes of service prices and drug outages are included in the models of use of public and private sector care. The measures of supply availability and supplementary food are included in the models of visits to health posts and receipt of Vitamin A. Standard errors are adjusted using a Huber correction to account for the fact that our data contain multiple observations from the same community.

Because we also want to investigate which groups of individuals were most likely to experience changes in use of health care, we include in our regression models measures of individual and household characteristics in 1997. Two of our measures, gender and (for children under five) level of maternal education, do not change between survey rounds, while age does so in a predictable way. Other measures such as per capita expenditure level do change between 1997 and 1998 in ways that are almost certainly related to the economic crisis. By using characteristics measured as of 1997, we contrast change in use of health care over time by pre-crisis level of socioeconomic status. This approach allows us to assess whether patterns of health care use were most disrupted for those of relatively low socioeconomic status in 1997. We include controls for household size and for urban residence. Means and standard deviations for the sample are presented in Table 4.

Use of Care among Individuals Five Years and Older

Results for use of care among respondents five and older are presented in Table 5. With respect to gender, males are somewhat less likely to use public care and considerably less likely to use private care, regardless of year, than are females (columns 1-4). This finding reflects

lower use among males 15 and older rather than by lower use among male children and

adolescents (results not shown). In the model of individual transitions in use of care (columns 5-

8), males have lower transition rates than females (the coefficients are all negative), but the

differences are not statistically significant.

In the models presented in Table 5 age is included as a linear spline, with knots at 15, 30,

and 50 years of age. Within an age interval the relationship between age and use is linear, but

the specification allows the slope of the line to vary across the four age intervals created by the

position of the knots. The coefficients are interpreted as the impact of an additional year of age

on the (log) odds of use, within the particular age interval. For individuals under 15, use declines

significantly with each extra year of age, with one exception: use of private care in 1998. Given

that overall use of private care fell between 1997 and 1998, the change across years in the

significance of the age coefficient for children 5-14 can be interpreted as evidence that between

1997 and 1998, relatively younger children stopped using private care, so that by 1998 the

chance of using private care was equalized within this age range. Among adults, the relationship

between age and use of care changes relatively little between 1997 and 1998, although there is

some evidence that in the 15-29 age group the positive impact of increasing age on use of private

care was stronger in 1997 than in 1998. Among adults the relationship between age and use of

care is generally positive, although it is not always significant.

Level of 1997 household per capita expenditure displays a strong relationship with use of

care. As with age, per capita expenditure is included as a linear spline, in this case with one knot

at the 33rd percentile. We refer to individuals in the bottom third of the expenditure distribution

as the poor and near-poor, because in Indonesia in 1997 about 11% of the population was

classified as below the poverty line on the basis of spending levels (per capita) in their

households. We refer to individuals in households in which spending is above the 33% as the relatively better-off.

In 1997, for the poor and near-poor use of both public and private care shows a strong positive relationship with economic status. As the spending level of the household rises, so too does use of public and private care among individuals within the household. The magnitude of the effect is about 50% larger for private than for public care. By 1998, for those in the bottom third, the positive association between expenditure levels and use of public care has disappeared.

For the poor and near-poor, the results for per capita expenditure in the cross-sectional models are largely replicated in the model of transitions (columns 5-8). Among the less well-off, rising levels of expenditures are associated with a greater likelihood of transitioning into and out of use of private care (Columns 5 and 6). With respect to transitions out of public care (Column 7), for those in the lower third of the expenditure distribution, rising expenditures are associated with a greater likelihood of transitioning out of use of public care, which likely reflects the fact that in 1997 they were more likely to use public care in the first place.

For those in the upper two-thirds of the expenditure distribution, as expenditure levels rise the chance of using private care increases in both 1997 and 1998. The relationship between additional expenditures and use of public care, however, is negative (p=.075) in 1997. This relationship has disappeared by 1998. Among those who were better off in 1997, rising levels of expenditure are associated with a greater likelihood of transitioning into use of private care, but with a lower likelihood of losing public care (because the best-off were less likely to use public care in 1997). Generally expenditure levels have a much weaker association with patterns of use for those in the upper two-thirds of the distribution than for those in the lower third.

The lower panel of the table presents the results for facility characteristics. In the models of use of care in 1997, we include the measures of prices and drug stock outages for the facilities interviewed in an individual's community in 1997. The choice to use public care in 1997 is somewhat more likely as prices in the private sector rise and substantially less likely when the public sector stock outage index is high. Thus, relatively high prices in the private sector encourage use of the public sector, whereas low quality as measured by drug stock outages decreases use of public sector services. None of the facility characteristics are related to choice of private sector care in 1997.

In the models for use of services in 1998 and for transitions in service use, we include measures of the levels of facility characteristics in 1997 and in 1998. Because we control for the level of the characteristic in 1997, the coefficient for the 1998 measure captures the relationship between use and the *change* in the characteristic since 1997.

None of the facility characteristics we consider are significantly related to use of public care in 1998. As drug stock outages at public facilities rise, however, use of private facilities rises as well (Column 4). This result appears in the transitions model (Column 6) as well. Stock outages at public facilities in 1997 are negatively associated the transition out of use of public care (Column 7) because public care use was more likely in 1997 where public sector prices were high. On the other hand, transitions out of use of public care in 1998 are somewhat reduced in areas where private sector prices in 1998 were high relative to their 1997 levels (p=.09). None of the facility characteristics are associated with transitions out of use of private care in 1998.

Use of Health Care and Preventive Services among Children Less than Five Years Old

We turn now to results for the children less than five (Table 6). For this group panel data are available for only 494 individuals. As noted above, given the relatively low levels of use of

public and private care, this sample size is insufficient to precisely estimate the transitions

models, and so we present only the cross-sectional results. The correlates we include are the

same as those for the models of adults, except that we add a measure of maternal education (the

metric is years completed).

In 1997 boys are considerably more likely to use private care than are girls. This

relationship does not emerge for private care in 1998, or for public care in either year. In neither

1997 nor 1998 is the child's age related to use of public care. In 1997, however, older children

are less likely to use private services. By 1998 that relationship has weakened (the coefficient

changes from -.387 to -.229 and is no longer significant at the 5% level), suggesting that between

1997 and 1998 use of private services fell most for the relatively younger children.

Many studies have shown that maternal education is positively related to children's

health status and negatively related to mortality risks. We find that although level of maternal

education is not strongly related to use of either public or private facilities in 1997, by 1998 a

positive and statistically significant relationship has emerged for use of both sectors relative to

using no care. Thus, it appears that during economic downturn, mothers with relatively more

education were better able to protect use of care by their young children than were mothers with

less education.

It is sometimes argued that the positive relationship between maternal education and

children's health outcomes arises at least in part because maternal education proxies for

socioeconomic status. Our measure of expenditure level is a much more direct indicator of

socioeconomic status than is maternal education. Among children in households in which

expenditure levels are below the 33rd percentile, increasing levels of expenditures are unrelated

to use public health care in 1997, but are positively associated with use of private care. By 1998,

for the least well-off group, increasing levels of expenditures are no longer associated with use of private care. With respect to public care, however, the coefficient on expenditure level is more than triple its size in 1997, although it is not statistically significant (p=.13).

As was true for older Indonesians, for children in the upper two-thirds of the expenditure distribution the association between expenditure level and use of care is much weaker. In 1998 among the relatively better-off use of private care rises with expenditure level.

We turn now to the results for facility characteristics. In 1997 use of private care is more likely as the fraction of public facilities experiencing stock outages rises. In 1998 service prices affect the decision to use private care, rather than drug stock outages. The choice of private services is less likely where service prices in 1997 were high, but more likely where the change in service prices has been large.

Figure 2 revealed far more dramatic declines in use of preventive care than in use of public and private care for children under five.

Table 7 shows the regression results for use of preventive care among children less than five. Gender is not related to use of a health post or receipt of Vitamin A in either 1997 or 1998, nor with changes in these behaviors. In 1997 age is unrelated to use of a health post but is positively related to receipt of Vitamin A. In 1998 the reverse is true: age is associated with a decreased chance of using the health post, but is no longer associated with receipt of Vitamin A. Thus, it appears that use of preventive care changed most for the older children. By 1998 they were significantly less likely to have visited a health post, and were no longer more likely to receive Vitamin A (because Vitamin A uptake declined over time, the negative coefficient on age suggests reduced uptake among the older children rather than increased uptake among the younger children).

As with use of public and private care, as maternal education rises children's use of preventive services is protected. Children with better educated mothers were more likely to receive Vitamin A in 1997 and more likely to visit a health post in 1998. In the cross-sectional models of health post use, the coefficient on maternal education is nearly twice as large in 1998 as in 1997. In the transitions models higher levels of maternal education also decrease the chance of transitioning out of use of a health post.

Although expenditure levels are related to use of public and private care, they are not related to use of preventive services (which are largely free) in either year, or to transitions in use of preventive care. The declines in use of preventive services depicted in Figure 2 apparently occurred across the economic spectrum.

In the models for use of preventive care we include two measures of the characteristics of health posts: availability of supplies and the fraction of posts (within the community) that offer supplementary food. Of these, in 1997 the availability of supplementary food is positively associated with the chance that a child received Vitamin A. In 1998, use of health posts rises as the availability of supplementary food rises, but neither characteristic of the health post is related to receipt of Vitamin A.

In the transitions model the availability of supplementary food shows a strong relationship with transitions in and out of use visiting health posts. Communities in which a high proportion of health posts offer supplementary food appear better able to attract mothers and children to the posts. This result is unlikely to arise solely because of a correlation between supplementary food and other aspects of quality and organization, since the availability of supplies (which surely also reflects organization) does not have the same strong association.

DISCUSSION AND CONCLUSIONS

The factors underlying changes in patterns of health care use that occurred in the first year of Indonesia's economic crisis are complex and operate at the community level, as well as at the individual and household level. We briefly summarize key findings from our analysis below.

One facet of the story, presented in Tables 1-3, is that the price and quality of available health services changed between 1997 and 1998. Prices for basic services rose at both public and private facilities, while quality declined at public facilities, at least as measured by the frequency with which common medicines were out of stock. Quality also declined at community-sponsored health posts that offer preventive services for children under five. On average, fewer of these posts offered supplementary feeding in 1998 and basic supplies were less available as well.

Facility characteristics are related to use of care in both 1997 and in 1998, and the results are similar both for children less than five and for individuals five and older. In particular, high prices for private services encouraged use of public care among older individuals in 1997 and discouraged use of private care for the youngest children in 1998. In 1997 drug stock outages at public facilities discouraged use of public care for the older age group and encouraged use of private care for the younger age group. In 1998 public sector stock outages were not related to patterns of care use by the young children, but served to encourage reliance on the private sector by the older age group.

The importance of supply side factors to use of care also emerges in use of preventive services by young children. In particular, the availability of supplementary food at health posts encouraged use visits to health posts in 1998.

We considered several individual and household characteristics as correlates of use of care. Gender is not strongly related to use of care, although men are less likely than women to use private services in either year. Age is more closely related to use of care among children than for adults 15 and older, but for neither group does the relationship between age and use of public or private care change substantially between 1997 and 1998. For the younger respondents, age is generally negatively related to use of care. For the older respondents age tends to be positively related to use of care, but in many cases is not statistically significant. With respect to preventive care, it appears that the children closer to the age of five are the ones for whom use fell the most.

Measures of socioeconomic status display interesting patterns with respect to use of care, particularly with respect to differences by age. Among the youngest children, socioeconomic status as measured by household expenditure level is not related to use of public services, but is associated with use of private services. In 1997, resources make a difference for the children in the poor and near-poor households. Below the 33rd percentile of the expenditure distribution, use of private care is more likely as expenditure levels rise. This relationship does not appear in 1998, but instead the positive relationship appears for children in households above the 33rd percentile of the (1997) expenditure distribution. For older children and adults, the relationship between use of private care and expenditure level changes little between 1997 and 1998 (it is positive above and below the 33rd percentile but larger for the poor and near-poor households than for the better-off households). For older children and adults, use of public sector services is associated with expenditure levels in 1997 (positively for the poor and near-poor, negatively for the better off), but is not associated with use of public care in 1998.

For the youngest children, we also consider the relationship of maternal education to use

of public and private care and to use of preventive services. As level of maternal education rises,

the health care use of young children appears to be protected during the economic crisis. This is

true for use of public and private care in 1998, and for use of health posts in 1998. In fact, the

only behavior for which maternal education does not appear to offer a protective benefit is

receipt of Vitamin A tablets.

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Figure 1 : Timing of the IFLS and the Indonesian Exchange Rate

Figure 2

Declines in Use of Care between 1997 and 1998, by Age Group and Type of Care

* changes statistically significant at 5%, preventive care results for children 0-4 only
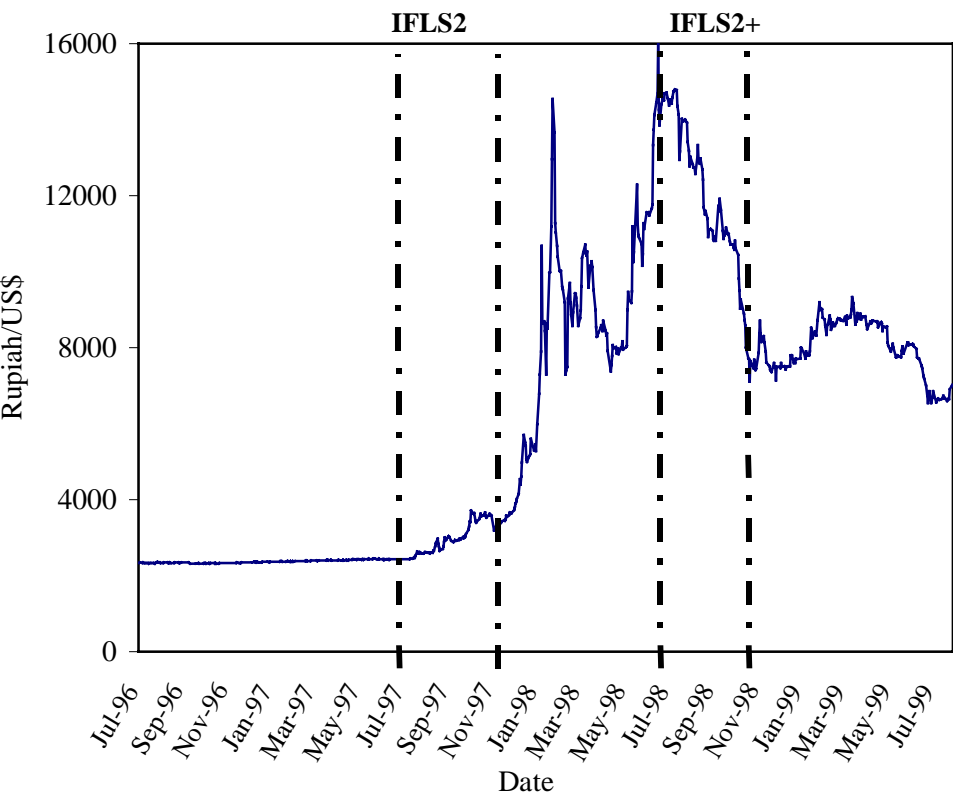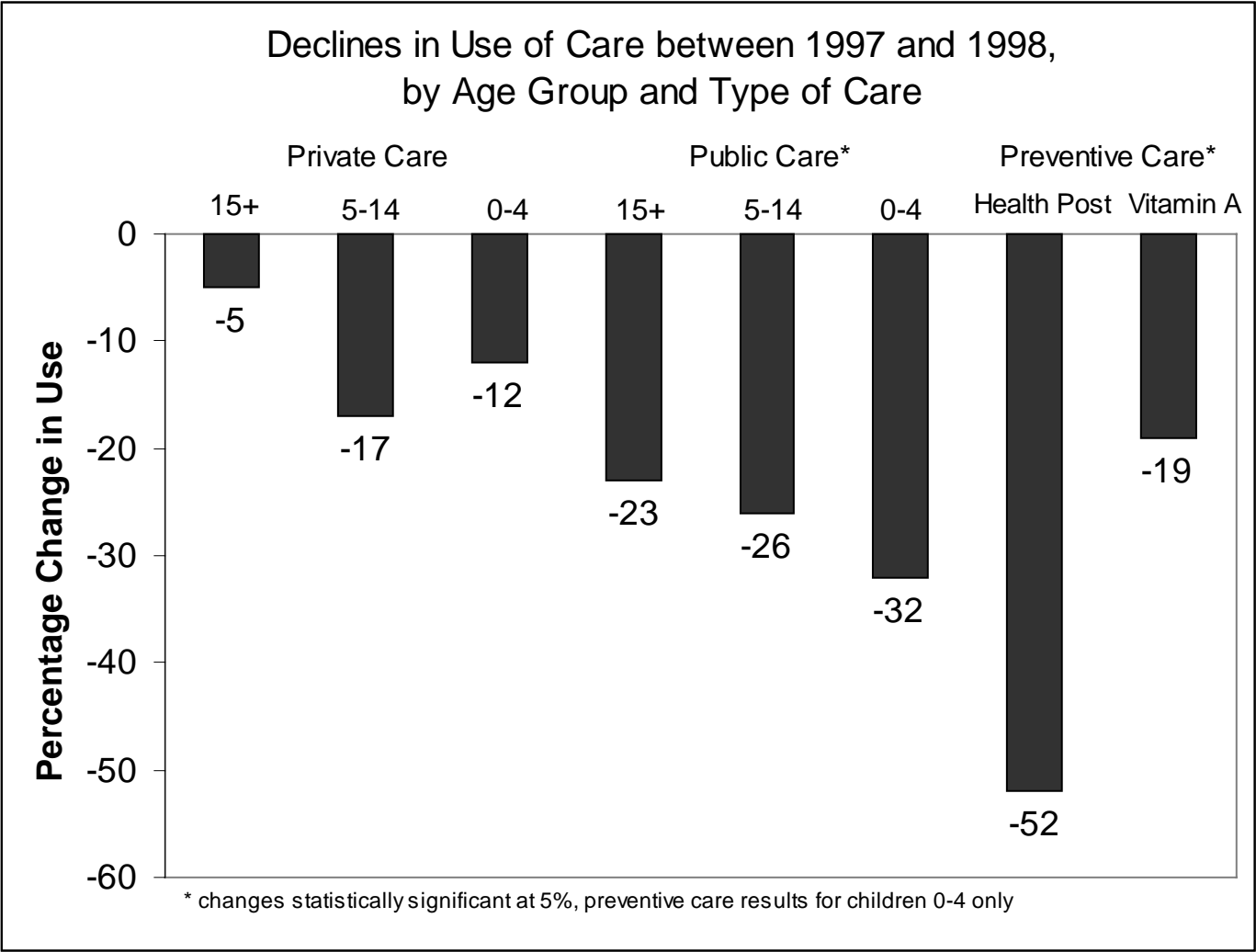
Table 1
Characteristics of Public and Private Health Facilities, 1997 and 1998

	Public Health Centers			Private Practices		
	Level In 1997	Level in 1998	Change	Level In 1997	Level in 1998	Change
Percent that offer/have:						
Curative care including medicine	99	99	0	83	88	5*
Wound stitching	92	92	0	58	60	2
BCG vaccine	77	75	-2	31	27	4
Test of hemoglobin level	61	45	-16*	14	15	1
Vitamin A	88	73	-15*	55	35	20*
Service Costs (mean, Rupiah)						
Curative care including medicine	847	966	120	6448	10056	3608*
Wound stitching	2239	2651	412*	5954	8707	2753*
BCG vaccine	460	615	245*	4727	6152	1425*
Test of hemoglobin level	670	944	274*	3029	4357	1328
Ampecillin (500 mg tablet)	33	38	5	587	923	336*
Tetracycline (250 mg tablet)	19	19	0	379	557	178*
Antalgin (500 mg tablet)	16	21	5	549	731	182*
Acetosol (500 mg tablet)	15	24	9	701	1102	401*
Oral Rehydration Solution (5 200 ml packets)	160	231	71	4179	5703	1524*
Percent with stock outages, past six months						
Ampicillin	23	42	19*	16	21	5
Tetraciclin	16	21	5	10	16	6*
Antalgin	10	13	3	8	12	4
Acetosal	7	16	9*	6	13	7
Cough syrup	11	27	16*	8	0	8
Oralit	6	11	5*	8	11	3
Iron tablets	4	5	1	7	9	2
N	260	237		524	479	

* p <=.05.

Table 2
Characteristics of Health Posts, 1997 and 1998

	Level in 1997	Level in 1998	Change by 1998
Number of Health Worker Visits in Previous Year	10.0	9.6	-0.4
Percent that have:			
Supplementary feeding	84%	72%	-12*
Baby Scales	95	96	1
Child Health Card	93	78	-15*
Oral Rehydration Solution	79	87	-12*
Iron Supplementation	59	53	-6
Vitamin A	82	49	-33*

* $p <= .05$

Table 3
Measures of Facility Quality at the Community Level

	1997	1998	Difference	
Index of Service Costs at Public Facilities	1242 Rp.	1573 Rp.	330*	(102)
Index of Service Costs at Private Practices	5506 Rp.	7813 Rp.	2307*	(459)
Index of Drug Stock Outages at Public Facilities	12.2%	20.0%	7.8*	(3.0)
Index of Drug Stock Outages at Private Practices	10.1	13.5	3.4	(2.0)
Index of Supply Availability at Health Posts	3.1 items	2.5 items	-0.6*	(0.1)
Index of Availability of Supplementary Food at Health Posts	83.7%	72.4%	-11.3*	(5.0)
N	80	80		

* $p <= .05$

Table 4   Descriptive Statistics

	Mean
Individual and Household Characteristics (1997)	
Male	47%
Age (if older than four)	30
Age (if younger than four)	1.7
Mother's Years of Education (if child <5 years)	6.25
Household per capita Expenditure (Rupiah)	136,167
Household Size	5.25
Urban	42%
Use of Care (individuals five and older)	
Public Care 1997	6.3%
Private Care 1997	5.7
Public Care 1998	4.9
Private Care 1998	5.7
Transition Into Use of Public Care	3.5
Transition Into Use of Private Care	4.6
Transition out of Use of Public Care	4.9
Transition out of Use of Private Care	4.6
Use of Care (children less than five years)	
Public Care 1997	11.7%
Private Care 1997	13.2
Public Care 1998	8.1
Private Care 1998	11.7
Health Post 1997	50.4
Health Post 1998	23.5
Vitamin A 1997	58.7
Vitamin A 1998	46.3
Visit Health Post both Years	17.6
Transition into visiting a Health Post	5.9
Transition out of visiting a Health Post	32.8
Receive Vitamin A both Years	32.9
Transition into receiving Vitamin A	13.4
Transition out of receiving Vitamin A	26.0

Sample of individuals five and older consists of 5,644 respondents interviewed in IFLS2 and IFLS2+. Sample is 494 children less than five years old in 1997, interviewed in IFLS2 and IFLS2+.

Table 5. Use of Health Care by Year and Sector, Individuals Five Years and Older

		Use in 1997		Use in 1998		Changes in Use of Care, 1997-98			
		Public	Private	Public	Private	Into Public	Into Pvt	Out of Pub	Out of Pvt
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Individual & Household Characteristics									
Male		-0.199	-0.310**	-0.277	-0.264**	-0.243	-0.187	-0.165	-0.236
		(0.116)	(0.108)	(0.174)	(0.104)	(0.205)	(0.116)	(0.138)	(0.123)
Age (spline)	5-14	-0.085**	-0.072**	-0.109**	-0.037	-0.087**	-0.006	-0.059	-0.046
		(0.029)	(0.033)	(0.045)	(0.037)	(0.043)	(0.040)	(0.033)	(0.035)
	15-29	0.033	0.054**	0.030	0.033	0.004	0.015	0.012	0.038
		(0.018)	(0.017)	(0.021)	(0.018)	(0.023)	(0.020)	(0.018)	(0.020)
	30-49	0.015	-0.001	0.030**	0.023**	0.035**	0.033**	0.019	0.005
		(0.012)	(0.012)	(0.014)	(0.011)	(0.018)	(0.013)	(0.011)	(0.014)
	50 and above	0.011	0.023**	0.005	0.011	-0.003	-0.008	0.006	0.004
		(0.013)	(0.011)	(0.012)	(0.011)	(0.017)	(0.013)	(0.015)	(0.013)
Household per capita	<=33%	0.738**	1.120**	0.515	1.115**	0.432	0.846**	0.726**	0.876**
Expenditure (spline)		(0.286)	(0.277)	(0.320)	(0.322)	(0.305)	(0.313)	(0.291)	(0.293)
	> 33%	-0.195	0.274**	0.166	0.366**	0.093	0.254**	-0.309**	0.156
		(0.110)	(0.103)	(0.119)	(0.106)	(0.155)	(0.106)	(0.120)	(0.116)
Facility Characteristics									
1997: Service costs, public		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Service costs, private		0.062**	-0.050	0.018	-0.032	0.036	-0.017	0.087**	-0.046
		(0.026)	(0.034)	(0.045)	(0.041)	(0.048)	(0.049)	(0.043)	(0.046)
Drug stock outs, public		-1.288**	-0.280	0.476	-0.445	0.626	-0.427	-1.376**	-0.123
		(0.615)	(0.530)	(0.767)	(0.454)	(0.794)	(0.510)	(0.652)	(0.485)
Drug stock outs, private		0.335	-0.075	0.411	0.040	0.486	0.111	0.439	0.033
		(0.871)	(0.538)	(1.018)	(0.641)	(1.036)	(0.616)	(0.732)	(0.530)
1998 Service costs, public				0.000	0.000	0.000	0.000	0.000	0.000
				(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Service costs, private				0.042	0.002	-0.012	-0.010	-0.091	-0.002
				(0.076)	(0.048)	(0.075)	(0.052)	(0.055)	(0.047)
Drug stock outs, public				-0.322	1.137**	0.020	1.044**	-0.323	0.214
				(0.837)	(0.420)	(0.927)	(0.440)	(0.403)	(0.483)
Drug stock outs, private				-1.543	-0.088	-1.457	-0.249	-0.207	-0.144
				(0.822)	(0.664)	(0.860)	(0.708)	(0.640)	(0.771)
Intercept		-4.090	-8.029	-4.540	-6.171	-3.968	-5.269	-3.502	-7.650
		1.422	1.438	2.218		(.197)	(1.659)		(1.630)
F test, facility characteristics			18.3**		30.7**		87.5**		
Chi-square (Model)			346.4**		692.5**		2951.7**		

Sample is 5,644 individuals age five years and older (in 1997) interviewed in IFLS2 and IFLS2+. Columns 1-4 estimated with logistic regression, columns 5-8 estimated with multinomial logit (excluded category is no change in use between 1997 and 1998). Standard errors (in brackets) are adjusted for clustering at the community level. **=p<.05.

Table 6.   Use of Health Care by Year and Sector, Children less than Five Years Old

		1997		1998	
		Public (1)	Private (2)	Public (3)	Private (4)
Individual and Household Characteristics					
Male		0.063	0.616**	0.586	0.215
		(0.288)	(0.312)	(0.452)	(0.329)
Age		-0.205	-0.387**	-0.115	-0.229*
		(0.145)	(0.131)	(0.155)	(0.137)
Mother's years of education		-0.015	0.084	0.107**	0.112**
		(0.042)	(0.051)	(0.045)	(0.053)
Household per capita	<=33%	0.442	1.646*	1.769	0.888
Expenditure (spline)		(0.577)	(0.931)	(1.193)	(0.697)
	> 33%	-0.004	0.280	0.289	0.584**
		(0.281)	(0.307)	(0.371)	(0.287)
Facility Characteristics					
1997: Service costs, public		0.000	0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)	(0.000)
Service costs, private		0.021	-0.035	0.017	-0.285**
		(0.063)	(0.068)	(0.090)	(0.085)
Drug stock outs, public		-0.852	3.278**	0.040	0.426
		(0.973)	(0.914)	(1.022)	(0.969)
Drug stock outs, private		-0.111	-2.308	2.197	-1.760
		(1.104)	(1.479)	(1.447)	(1.132)
1998 Service costs, public				0.000	0.000
				(0.000)	(0.000)
Service costs, private				0.022	0.170**
				(0.110)	(0.085)
Drug stock outs, public				-1.247	0.561
				(1.327)	(0.911)
Drug stock outs, private				-0.229	1.240
				(1.466)	(1.207)
Intercept		-5.671	-8.473	-13.992	-5.999
		3.497	4.055	5.490	3.535
F test, facility characteristics		30.6**		19.6	
Chi-square, Model		196.5**		196.2**	

Sample is 494 children less than five years old in 1997, interviewed in IFLS2 and IFLS2+. Models are estimated with logistic regression. Standard errors (in brackets) are adjusted for clustering at the community level. *=p<.10, **=p<.05.

Table 7. Use of Preventive Care Among Children Less than Five, by Year

	1997		1998		Change in Health Post Visits		Change in Receipt of Vitamin A	
	Visit Post	Receive Vitamin A	Visit Post	Receive Vitamin A	Out of Use	Into Use	Out of	Into
	(1)	(2)	(3)	(4)	(6)	(7)	(9)	(10)
Individual and Household Characteristics								
Male	0.081	-0.058	0.128	0.083	-0.242	-0.437	-0.263	-0.240
	0.169	0.235	0.219	0.192	0.279	0.469	0.273	0.298
Age	-0.094	0.308**	-0.367**	0.095	0.264*	-0.252	-0.092	-0.385**
	0.093	0.084	0.116	0.080	0.139	0.185	0.110	0.143
Mother's years of education	0.046	0.065*	0.088*	0.047	-0.109**	-0.104	0.004	0.015
	0.029	0.034	0.046	0.033	0.054	0.075	0.038	0.054
Household per capita expend. <=33%	0.493	0.288	0.841	0.487	-0.771	-0.143	-0.628	-0.387
(spline)	0.405	0.397	0.667	0.437	0.765	1.279	0.614	0.523
> 33%	-0.299	0.108	-0.211	0.093	0.102	0.250	-0.250	-0.336
	0.193	0.248	0.269	0.214	0.345	0.419	0.272	0.350
Facility Characteristics								
1997: Supply Availability	0.250	0.226	0.416*	0.063	-0.417	-0.449	-0.146	-0.368
	0.155	0.144	0.220	0.169	0.256	0.348	0.183	0.257
Supplementary Food Offered	0.029	1.235**	-0.250	-0.271	-0.202	-1.164*	0.328	-1.365**
	0.350	0.297	0.468	0.326	0.540	0.702	0.457	0.487
1998 Supply Availability			-0.009	-0.044	0.016	0.392	-0.003	-0.141
			0.210	0.135	0.216	0.278	0.141	0.212
Supplementary Food Offered			1.353**	0.497	-1.554**	-1.393	-0.492	-0.948
			0.612	0.446	0.735	0.971	0.503	0.671
Intercept	-2.129	-2.961	-2.906	-2.862	1.847	1.321	4.622	4.674
	1.982	1.721	2.948	2.039	4.301	6.328	2.882	2.622
F test, joint signif. of facility characteristics	2.6	19.0**	7.3	2.0	22.3**		27.6**	
Chi-square (Model)	31.6**	98.6**	81.2**	35.7**	6499.9**		1084.2**	

Sample is 503 children less than five years old in 1997, interviewed in IFLS2 and IFLS2+. Columns 1-4 estimated with logistic regression, columns 5-8 estimated with multinomial logit. Reference category for change in health post is visiting a health post in both years, reference category for change in receipt of Vitamin A is receiving Vitamin A in both years. Standard errors (in brackets) are adjusted for clustering at the community level. *p<=.10, **p<=.05.